

# centennial challenges



## Innovation from Diverse Communities vs. Domain Focus Communities



DURATION	- Years	- Months	- Months	- Days/Weeks
PRIZES	- Multimillion \$	- \$1K to \$100K	- Recognition	- Recognition
PRODUCTS	- Technology Demos	- Ideas, Design, Software	- Scientific Observations	- Software Apps
PARTICIPATION	- Mainly USA	- Worldwide	- Worldwide	- Worldwide

NASA Solve: [nasa.gov/solve](http://nasa.gov/solve)

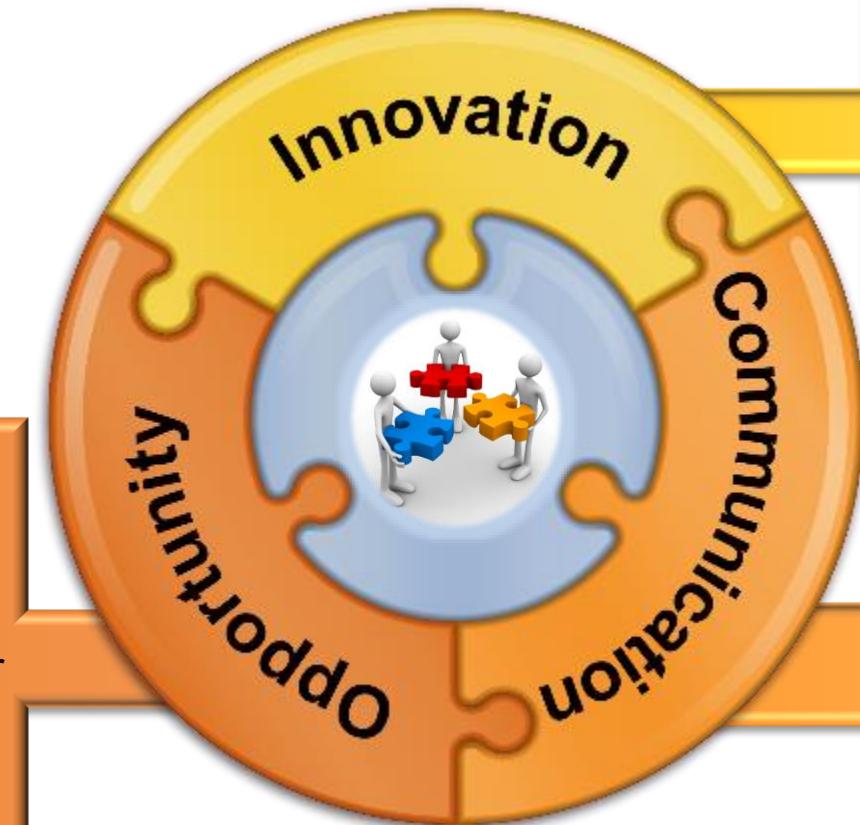
Centennial Challenges Program is part of NASA's Challenges, Prizes and Competitions Community: "NASA Solve"

# centennial challenges



Invites the Nation  
to be part of the  
*Journey to Mars*

- Maximize return on investment by:
  - Partnering
  - Paying only for success
- Provide opportunities for technology transfer



- Seeks innovation from diverse non-traditional sources
- Pushes the boundary of human potential

- Gets significant media attention
- Captures public imagination
- Engages people and communities

**Provides innovative solutions for NASA and the Nation**

# centennial challenges...



...A Piece of Our

# JOURNEY TO MARS

Tissue  
Engineering

EXPLORATION

TECHNOLOGY



INTERNATIONAL  
SPACE STATION

Space  
Robotics

COMMERCIAL  
CARGO AND CREW

Cube  
Quest

SPACE LAUNCH  
SYSTEM (SLS)

ORION

SOLAR  
ELECTRIC  
PROPULSION  
ASTEROID  
REDIRECT  
MISSION

IN-SPACE  
HABITAT  
MARS  
TRANSFER  
SPACECRAFT

ORBITERS

LANDERS

PHOBOS  
DEIMOS

3-D  
Printed  
Habitat  
Sample  
Return  
Robot  
Mars  
Ascent  
Vehicle



**DREAM IT.  
MAKE IT.  
WIN IT.**



CENTENNIAL  
CHALLENGES



## Active Centennial Challenges Competitions



### **Mars Ascent Vehicle (MAV) Challenge/Competitions: 4/2015 and 4/2016**

Demonstrate ability to autonomously recover, load, and launch a “Mars sample”

**Allied Organization:** None

**Challenge Manager:** NASA/Marshall Space Flight Center (MSFC)

- FY15 competition: 15 teams; FY16 registration: 20 teams

**\$0.05M  
Prize Purse**  
\$40K awarded  
in FY15



### **Sample Return Robot Challenge (SRR)/Competitions: 6/2015; 6/2016, 9/2016**

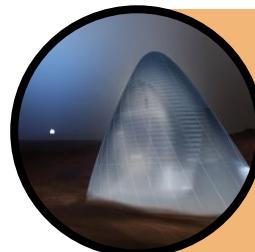
Demonstrate rovers that locate/retrieve without human control or terrestrial navigation aids

**Allied Organization:** Worcester Polytechnic Institute (WPI)

**Challenge Manager:** NASA/MSFC

- FY15 competition: 14 teams L1 and 2 teams L2; FY16 registration 25 teams

**\$1.50M  
Prize Purse**  
\$100K awarded  
in FY15



### **3D Printed Habitat Challenge/Competitions: 7/2015; next levels TBD**

Advance additive construction technology to create sustainable housing on Earth and beyond

**Allied Organization:** America Makes

**Challenge Manager:** NASA/MSFC

- FY15 Design competition: 167 entries; 94 met requirements; FY16 on hold

**\$2.25M  
Prize Purse**  
\$40K awarded  
in FY15



### **Cube Quest Challenge/Competitions: 8/2015, 2/2016, 8/2016 and 2/2017**

Demonstrate communication/propulsion technologies relevant to trans-lunar space exploration

**Allied Organization:** None

**Challenge Manager:** NASA/Ames Research Center (ARC)

- FY15 GT1 competition: 13 team; FY16 GT2 registration: 10 teams

**\$5.00M  
Prize Purse**  
\$100K awarded  
in FY15